Topic: Nets/Volume/Surface area of cylinders

Question: Find the volume of the cylinder.

Assume $\pi = 3.14$.

What is the volume of the right circular cylinder with

base radius $10'$

height $10'$

Answer choices:

A $3{,}140\ \text{ft}^3$

B $314\ \text{ft}^3$

C $3.14\ \text{ft}^2$

D $1{,}413\ \text{ft}^3$

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Solution: A

We'll use the formula

$$V = \pi r^2 h$$

Plugging in the dimensions of the cylinder we've been given, we get

$$V = (3.14)(10)^2(10)$$

$$V = (3.14)(100)(10)$$

$$V = 3{,}140 \text{ ft}^3$$

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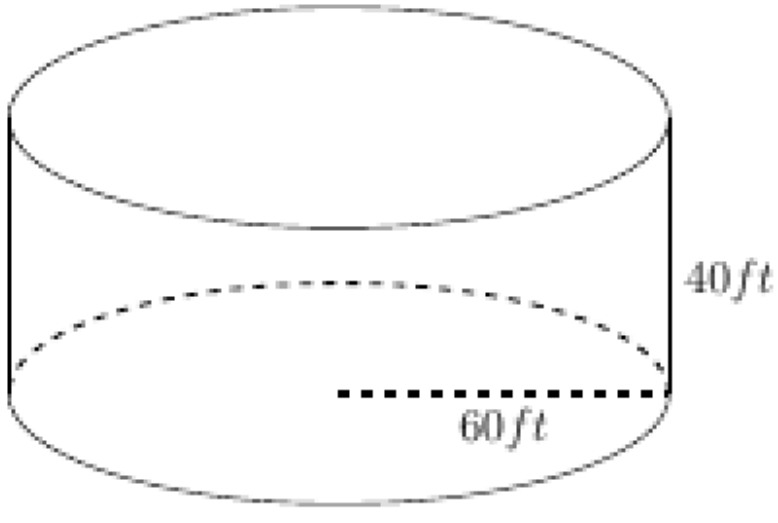
Topic: Nets/Volume/Surface area of cylinders

Question: How many square feet of steel will be needed?

A cylindrical steel oil tank is to be built to a height of 40 ft with a radius of 60 ft.



Answer choices:

A $8{,}000\pi$ ft^2

B $12{,}000\pi$ ft^2

C $18{,}000\pi$ ft^2

D $24{,}000\pi$ ft^2

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Solution: B

Use the formula for surface area of a cylinder.

$$S = L + 2B$$

or

$$S = 2\pi rh + 2\pi r^2$$

Substituting for h and r, we get

$$S = 2\pi(60)(40) + 2\pi(60)^2$$

$$S = 4{,}800\pi + 7{,}200\pi$$

$$S = 12{,}000\pi$$

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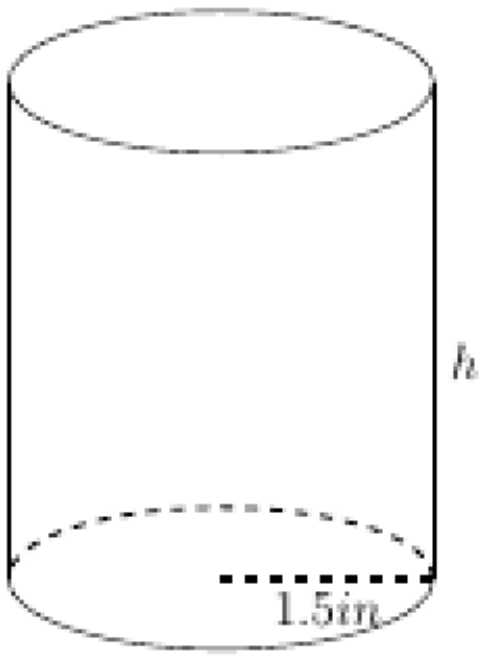
Topic: Nets/Volume/Surface area of cylinders

Question: Calculate the height.

A cylindrical steel soup can is to be built out of 16.5π in^2 steel with a radius of 1.5 in. What will be the height of the can?



Answer choices:

A 3 in

B 4 in

C 5 in

D 6 in

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Solution: B

Use the formula for surface area of a cylinder.

$$S = L + 2B$$

or

$$S = 2\pi rh + 2\pi r^2$$

Substituting for S and r, we get

$$16.5\pi = 2\pi(1.5)(h) + 2\pi(1.5)^2$$

$$16.5\pi = 3\pi h + 4.5\pi$$

Subtract 4.5π from both sides.

$$12\pi = 3\pi h$$

Divide both sides by 3π.

$$4 = h$$

With units, the result is 4 in.

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